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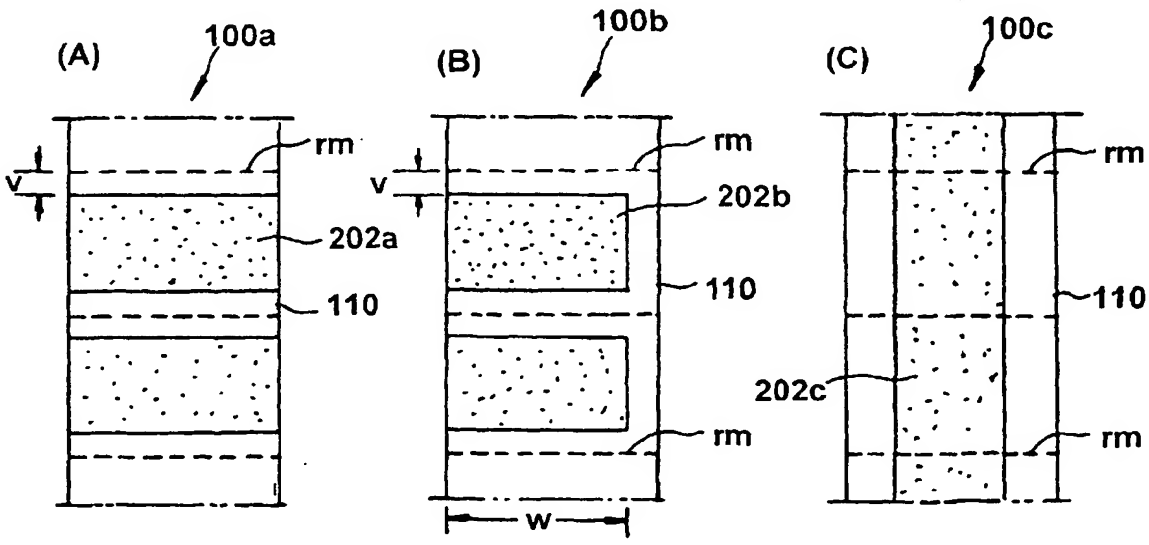
(54) Title: COLOR INDIVIDUAL PACKING SHEET FOR DISPOSABLE SANITARY NAPKIN



(57) Abstract: Disclosed herein is an individual packing sheet for a disposable sanitary napkin, comprising a nonwoven fabric-united film consisting of a non-woven fabric with a basic weight of 4 to 25 g/m^2 and a polymer film with a basic weight of 2 to 20 g/m^2, and a silicone release layer formed on the nonwoven fabric-united film by coating a thermosetting colored silicone coating agent on the nonwoven fabric-united film and heat curing such a coating agent. The silicone coating release layer contains organopolysiloxane and is partially formed on the nonwoven fabric-united in such a way that the release layer covers a hot melt of the sanitary napkin within an individual packing region of the sanitary napkin.

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COLOR INDIVIDUAL PACKING SHEET FOR DISPOSABLE SANITARY NAPKIN

Technical Field

The present invention relates to a colored individual packing sheet for a disposable sanitary napkin.

Background Art

As well known to those skilled in the art, recently, disposable sanitary napkins packed using a release paper and a polyethylene film bag, and disposable sanitary napkins in which a silicone release layer is formed on an inner side of a polyethylene film bag and a hot melt portion of the sanitary napkin is attached to the silicone release layer, have been widely used. Among these two kinds of sanitary napkin products, the sanitary napkin product having the silicone release layer formed on the inner side of the packing bag is more sought after and demand is increasing rapidly. In the above sanitary napkin products, a portion for protecting the hot melt of the sanitary napkin consists of a transparent silicone release layer.

Meanwhile, a user of the sanitary napkin is female, and the color of the packing bag for the sanitary napkin is considered an important marketing strategy. To satisfy female demand, a conventional sanitary napkin product has been produced, in which a film for producing a packing bag is colored by printing colors and patterns on a white polyethylene film or by adding a blue or pink color pigment to a resin used for forming the polyethylene film.

However, the conventional sanitary napkin product is disadvantageous in that a production cost of a colored film is increased when a colorant is added to a plastic film. In detail, when the colorant is added to a resin used for producing the plastic film, production problems such as gel, PCI, and pinhole occur during the production of the film, and cost of the plastic film is increased due to a coloring cost of the plastic film.

Another type of conventional packing sheet for the sanitary napkin is disclosed in Japanese Patent Publication No. 2000-175964, in which a packing bag consists of a polyethylene film having a coloring pigment and a silicone coating film cured by an electromagnetic ray or a ultraviolet ray is formed on an inner side of the packing bag in order to protect a hot melt of the sanitary napkin. However, this packing sheet is disadvantageous in that the coloring pigment added to the plastic film absorbs an electromagnetic or ultraviolet ray, and so a silicone release layer has poor release properties because curing efficiency of the silicone release agent is reduced. Another disadvantage of this packing sheet is that in the case of using a thermosetting silicone, the plastic film is deformed during a heat curing process of the thermosetting silicone, and so the packing sheet becomes stiff.

Disclosure of the Invention

Therefore, it is an object of the present invention to avoid the above disadvantages, and to provide a packing sheet for a disposable sanitary napkin which is colored by adding a colorant to a thermosetting silicone coating agent coated on a plastic film.

To accomplish the above object, the present invention provides a packing sheet for a disposable sanitary napkin, which is colored by coating a colored silicone coating agent on a plastic film and heat curing such a coating agent. The colored silicone coating agent is produced by adding a colorant to a thermosetting silicone coating agent.

It is another object of the present invention to provide a packing sheet for a disposable sanitary napkin, which can prevent a plastic film from deforming during a heat curing process of the colored silicone coating agent, and improve a texture and workability of the packing sheet by forming a colored silicone release layer on a nonwoven fabric-united film.

Based on the present invention, the above object can be accomplished by a provision of a packing sheet for a disposable sanitary napkin, which is colored by coating a colored silicone coating agent on a nonwoven fabric-united film and heat

curing such a coating agent. The colored silicone coating agent is produced by adding a colorant to a thermosetting silicone coating agent.

Brief Description of the Drawings

The above and other objects, features and other advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

Fig. 1 schematically illustrates a process of uniting a plastic film with a non-woven fabric according to the present invention;

Fig. 2 is a schematic front view of a mixer which is useful in the present invention;

Fig. 3 schematically illustrates a coating process of a silicone coating agent on a nonwoven fabric-united film according to the present invention;

Fig. 4 is a sectional view of an individual packing sheet for a disposable sanitary napkin according to the present invention;

Figs. 5A to 5C are schematic sectional views of individual packing sheets for the disposable sanitary napkin, in which a colored silicone coating agent is partially coated on the nonwoven fabric-united film;

Fig. 6 schematically illustrates a marking process of an individual packing region on the individual packing sheet according to the present invention;

Fig. 7 schematically illustrates a partial coating process of a silicone coating agent on a nonwoven fabric-united film according to the present invention;

Fig. 8 schematically illustrates a printing process of a pattern on a surface of the non-woven fabric according to the present invention; and

Fig. 9 illustrates the pattern printed on the surface of the non-woven fabric according to the present invention.

Best Mode for Carrying Out the Invention

According to the present invention, a silicone coating agent is selected

from the group consisting of a thermosetting coating agent, and a coating agent using an electromagnetic ray or a ultraviolet ray, that is to say, the coating agent cured by the electromagnetic or ultraviolet ray. When a colorant is added to the coating agent using the electromagnetic or ultraviolet ray, the colorant absorbs the electromagnetic or ultraviolet ray during a curing process of the colorant, and so the curing efficiency of the colorant is reduced, and therefore a desirable release layer cannot be obtained.

Useful in the present invention is the thermosetting silicone coating agent capable of curing the silicone while protecting the colorant without interfering with the colorant.

Meanwhile, the plastic film is deformed even though the thermosetting colored silicone coating agent of the present invention is coated on the plastic film and heat cured at 80 to 150℃, and so quality of the packing sheet becomes poor. That is to say, the plastic film becomes stiff due to increased strength of the plastic film, and a rustling sound occurs when the packing bag is handled.

Accordingly, in the present invention, the colored silicone coating agent is coated on a surface of the nonwoven fabric-united film and heat cured so as to prevent the plastic film from degrading during a heat curing process of the silicone coating agent.

In detail, a polyethylene based film with a melting point of 90 to 140℃ is united with a polypropylene based non-woven fabric with a melting point of 155 to 160℃ to produce the nonwoven fabric-united film, and the thermosetting colored silicone coating agent is coated on a surface of the nonwoven fabric-united film and heat cured to produce a colored individual packing sheet for a disposable sanitary napkin.

Therefore, the present invention is advantageous in that a thermosetting silicone coating agent is coated on a nonwoven fabric-united film and cured thereby preserving the flexibility of a plastic film, improving the workability of a packing sheet, and providing an outer surface of the packing sheet with a noiseless and soft non-woven fabric texture. Other advantages of the present invention are that a sealing temperature of the packing sheet of the present invention is higher

than that of a polyethylene film without being united with the non-woven fabric by 10 to 30℃, and so production time of the packing sheet is reduced and a deformation of the packing sheet due to a hot melt is prevented.

Particularly, a decorative pattern is printed on a surface of a non-woven fabric, and so the decorative pattern is in harmony with a color of a silicone layer, thereby the low-priced packing sheet looks like a high quality packing sheet.

Furthermore, the present invention is advantageous in that when the colored silicone coating agent is partially coated on the packing back, a process of producing a packing bag for a sanitary napkin is readily managed and a poor sealing (i.e. mis-attachment of a release layer to the nonwoven fabric-united film) is reduced by coloring the silicone coating agent because a portion of the packing back coated by the coating agent is observed by the naked eye during a production of the packing bag.

1-1) Production of a colorant used to produce a colored silicone coating agent

The colorant is mixed with a thermosetting silicone coating agent to produce the colored silicone coating agent.

An organic solvent of 85 to 95 parts by weight is blended with a coloring material such as a pigment or a dye of 5 to 20 parts by weight in a mixer for 1 hour or more to produce the colorant.

The coloring material may be dissolved or dispersed in the solvent by using a dispersing agent, if necessary.

A traditional mixing device such as a needer or a resolver is used to blend the coloring material with the organic solvent.

Examples of the coloring material used to produce the colorant include an organic coloring material such as a cyanine based blue coloring material and camine based red coloring material, and an inorganic coloring material such as carbon black and titanium dioxide, as described in Table 1, below.

TABLE 1

	Coloring material
Organic material	Copper phthalo cyanine
Organic material	2-hydroxy-3-naphthoic acid
Inorganic material	Carbon black
Inorganic material	Titanium dioxide (TiO_2)

The organic coloring material and the inorganic coloring materia1 may be used as the colorant in the present invention, and preferably, the organic coloring material having a good dispersibility is used as the colorant.

The dispersing agent used in conjunction with the coloring material in the present invention is selected from the group consisting of polyamide, ethylene-vinyl acetate copolymer, chlorinated polyethylene, and chlorinated polypropylene.

If necessary, a polyethylene wax, a slip agent, an antistatic agent, and a silicone oil may be added to the colorant.

The colorant of 0.1 to 10 parts by weight is mixed with the thermosetting silicone coating agent of 10 to 40 parts by weight in mixer for 1 hour or more to produce the thermosetting colored silicone coating agent.

1-2) Thermosetting coating agent

The thermosetting silicone coating agent used to produce the colored silicone coating agent of the present invention comprises a main component, a crosslinking agent, and a catalyst.

Organo polysiloxane may be selected from the group consisting of dimethyl methylvinyl siloxane, a hydroxy-terminated mixture; dimethyl siloxane, a hydroxy-terminated mixture; dimethyl, methylvinyl siloxane, a dimethyl vinyl-terminated mixture; octa methyl cyclo tetra siloxane; and dimethyl siloxane, a dimethyl vinyl-terminated mixture.

Organosiloxane such as methyl hydrogen siloxane and dimethyl hydrogen siloxane may be used as the crosslinking agent.

Useful in the present invention is a platinum catalyst. A diethylenyl tetramethyl disiloxane platinum complex mixture, organo polysiloxane, and an organosiloxane mixture are commercialized as the platinum catalyst.

The crosslinking agent links molecules of main components with each other and causes the main component to adhere to the film. The catalyst promotes a cross-linking reaction of the crosslinking agent with the main component.

The main component, the crosslinking agent, and the catalyst are dissolved in an organic solvent, water, or alcohol, coated on the film with the use of the roll, and the solvent is then volatilized.

The colorant is mixed with the silicone coating agent in a mixer.

With reference to Fig. 2, the thermosetting silicone coating agent 200 is mixed with the colorant in a mixer 201 for 1 to 5 hours to produce the colored silicone coating agent. When too much colorant is added to the thermosetting silicone coating agent 200, a release property of a silicone release layer is reduced.

The thermosetting colored silicone coating agent is coated on a surface of the plastic film, a solvent on the surface of the plastic film is volatilized, and such a coating agent is heated at 70℃ or higher to react the main component, the crosslinking agent, and the catalyst with each other to cure such a coating agent, thereby the colored silicone release layer having a release property is formed on the surface of the plastic film.

The higher the curing temperature of the silicone coating agent is, the faster the curing rate of the silicone coating agent is and the better the release property of the silicone coating agent is. Preferably, the curing temperature of the silicone coating agent ranges from 100 to 140℃.

2) The plastic film united with a non-woven fabric

Useful as a material of the plastic film used to unite with the non-woven fabric in the present invention is a polyolefin based polymer such as polyethylene and polypropylene, having a melting point of 90 to 140℃.

According to the present invention, the nonwoven fabric-united film can obtain a low melting point by mixing a polymer used as the material of the plastic film with a copolymer of a polyolefin based monomer and a monomer having a polarity.

Although the polyethylene film of the nonwoven fabric-united film according to the present invention becomes stiff due to heat during a curing process of the silicone, the polyethylene film is thinly formed on the non-woven fabric so as to have a basic weight of 2 to 20 g/m^2, and so a deformation of the plastic film by a heat is reduced and a soft texture of the non-woven fabric conceals imperfections of the nonwoven fabric-united film even though the nonwoven fabric-united film becomes slightly stiff due to heat.

3) The non-woven fabric

The non-woven fabric is selected from the group consisting of a polypropylene based non-woven fabric (a spunbond non-woven fabric, a thermalbond fabric), a polyester based non-woven fabric, and a nylon based non-woven fabric. In consideration of cost of the non-woven fabric and a physical property of the individual packing sheet, the polypropylene based spunbond non-woven fabric is useful as the non-woven fabric in the present invention.

In examples of the present invention, the non-woven fabric having a basic weight of 4 to 25 g/m^2 is united with a polymer film having a basic weight of 2 to 20 g/m^2 and a melting point of 90 to 140℃.

4) Uniting of the non-woven fabric with the plastic film

The non-woven fabric is united with the plastic film according to a traditional extrusion lamination uniting process, as shown in Fig. 1.

With reference to Fig. 1, a polyethylene resin is melted through an extruder 101 at 290℃ and molded through a T-die 102 into a film 103 with a basic weight of 2 to 20 g/m^2. The molded film is provided in conjunction with the non-woven fabric 107 with a basic weight of 4 to 25 g/m^2 between a cooling roll 106 and a compression rubber roll 105 in such a way that the non-woven fabric is positioned between the film and the compression rubber roll 105 to unit the non-woven fabric 107 with the polyethylene film 103, thereby producing the nonwoven fabric-united film 110.

The polyethylene film is united with the non-woven fabric by a pressure of

1 to 8 kg/cm^2 between the cooling roll and the compression rubber roll, like in a conventional extrusion lamination process of the plastic film and the non-woven fabric.

5) Formation of the silicone release layer

Examples of a coating machine used to coat the silicone coating agent on a surface of the nonwoven fabric-united film include a direct gravure coating roll, a roll coating roll, a reverse gravure coating roll, and an offset gravure coating roll.

In Fig. 3, the offset gravure coating roll is used to coat the coating agent on the nonwoven fabric-united film.

Referring to Fig. 3, the nonwoven fabric-united film 110 is provided by a roll 110a between the coating roll 113 and the compression rubber roll 114, and a surface of the plastic film of the nonwoven fabric-united film 110 is coated with the coating agent 200 by sufficiently providing the coating agent 200 to the coating roll 113 using an applicator roll 111. The coating agent on the film is dried and cured in a drying-curing chamber 115 to produce an individual packing sheet 100 for a disposable sanitary napkin, and then the individual packing sheet 100 is wound on a roll 116.

Fig. 4 is a sectional view of an individual packing sheet 100 for a disposable sanitary napkin according to the present invention. The plastic film 103 is united with the non-woven fabric 107 according to a process shown in Fig. 1 and the silicone release layer 200a is formed on a surface of the nonwoven fabric-united film according to a process shown in Fig. 3 to produce the individual packing sheet 100 for the disposable sanitary napkin.

The silicone release layer is coated on the nonwoven fabric-united film in such an amount that the cured release layer has a basic weight of 0.1 to 2 g/m^2.

6) Printing of a pattern on a surface of the non-woven fabric

The surface of the non-woven fabric is printed with the pattern using the direct gravure printing roll, as shown in Fig. 8.

Turning to Fig. 8, a copper plate 145 having a pattern of Fig 9 is positioned

on a printing roll 143. An ink 140 is provided to the copper plate 145 by a rotating printing roll 143, and a doctor blade 146 allows a proper quantity of ink to remain on the copper plate 145. The copper plate 145, on which the ink 140 is provided by a rotation of the printing roll 143, is in contact with a surface of the non-woven fabric of the nonwoven fabric-united film 110 and various patterns, such as the pattern shown in Fig. 9, on the copper plate are printed on a surface of the non-woven fabric by a pressure roll 144.

The ink printed on the surface of the non-woven fabric is dried by the dry chamber so as to be fixed on the surface of the non-woven fabric.

A device used to print the pattern on the non-woven fabric is located in a process line for coating a silicone coating agent on the non-woven fabric, and so production cost of the individual packing sheet is reduced.

7-1) Partial coating of a colored silicone coating agent on a silicone coated part

With reference to Figs. 5A to 5C, illustrated are schematic sectional views of individual packing sheets 100a, 100b, and 100c for a disposable sanitary napkin, in which the silicone release layer is coated on a surface of the nonwoven fabric-united film.

In the packing sheet 100a for the sanitary napkin, an individual packing region for the sanitary napkin on a surface of the nonwoven fabric-united film 110 is partitioned by a restricted mark (rm), and a pattern is printed on a partial silicone coated part 202a in such a way that the pattern is positioned at an offset value v apart from the restricted mark (rm), as shown in Fig. 5A.

A pattern on the partial silicone coated part 202a as shown in Fig. 5A forms a rectangular on the packing sheet 100 for the sanitary napkin.

In Fig. 5B, in the packing sheet 100b for the sanitary napkin, an individual packing region for the sanitary napkin on a surface of the nonwoven fabric-united film 110 is partitioned by a restricted mark (rm), and a pattern is printed on a partial silicone coated part 202b in such a way that the pattern is positioned at an offset value v apart from the restricted mark (rm). In addition, a pattern width w

on the silicone coated part 202b is narrower than a width of the nonwoven fabric-united film.

Referring to Fig. 5C, in the packing sheet 100c for the sanitary napkin, an individual packing region for the sanitary napkin on a surface of the nonwoven fabric-united film 110 is partitioned by a restricted mark (rm), and a pattern is printed on a silicone coated part 202c in a band shape while leaving spaces at both sides of the nonwoven fabric-united film.

The restricted mark (rm) of the individual packing region for the disposable sanitary napkin is used as a mark for discerning the individual packing region of the sanitary napkin, and used as a mark for indicating a cutting position of a sealed packing bag. Also, the restricted mark is used as the mark for examining whether the silicone coating agent is coated at a predetermined position when the silicone coating agent is coated on the silicone coated part 202a, 202b, and 202c.

According to the present invention, in comparison with the whole silicone coated part, the partially silicone coated part can reduce the amount of silicone coating agent consumed. In addition, when the sanitary napkin is packed by the packing back, the packing sheet is thermally attached while avoiding the silicone coated parts 202a, 202b, and 202c, and so a poor attachment due to the silicone release layer of the packing bag for the sanitary napkin is avoided.

7-2) Printing of the restricted mark

The restricted mark (rm) of the individual packing region is printed on the nonwoven fabric-united film according to a process shown in Fig. 6.

In more detail, the nonwoven fabric-united film is provided between a pressure rubber roll 134 and a direct gravure printing roll 133 having a copper plate 135 on which the restricted mark is patterned. The restricted mark patterned on the copper plate 135 partitions the continuous packing sheet into the individual packing regions. An ink 130 is provided to the copper plate 135 positioned on the rotating printing roll 133 and remains only on a restricted mark portion through a doctor knife 136, and is printed on a surface of the nonwoven fabric-united film 110 in a form of the restricted mark by the pressure rubber roll 134. The

nonwoven fabric-united film 110 then passes through the drier 135 in which the ink printed on the film 110 is dried.

9) Formation of the partial silicone release layer of the individual packing region

The partial silicone coated part is formed in the individual packing region according to a process described in Fig. 7.

With reference to Fig. 7, the nonwoven fabric-united film 110, on which the restricted mark (rm) is printed, is provided between the pressure rubber roll 124 and the direct gravure coating roll 123 having the copper plate 125. The partial silicone coated pattern is formed on the copper plate 125 so as to coat the silicone coating agent at a predetermined position of the individual packing region. The silicone coating agent 200 is provided to the copper plate 125 positioned on the rotating coating roll 123, and remains only on a partial silicone coated pattern when the silicone coating agent is removed from the copper plate by the doctor knife 126. The pattern coating agent on the copper plate is moved to a surface of the nonwoven fabric-united film 110 by the rubber roll 124 while the partial silicone coated pattern passes through the rubber roll 124 to coat the silicone coating agent on the nonwoven fabric-united film 110 along the predetermined pattern in the individual packing region, and dried and cured by the drying chamber 127 to produce a release layer.

As described above, the present invention provides a packing sheet for a disposable sanitary napkin, which is colored by coating a colored silicone coating agent on a plastic film and heat curing such coating agent. The colored silicone coating agent is produced by adding a colorant to a thermosetting silicone coating agent.

Furthermore, the present invention provides a packing sheet for a disposable sanitary napkin, which can prevent a plastic film from deforming during a thermal curing process of the colored silicone coating agent, and improve a texture and workability of the packing sheet by forming a colored silicone release layer on a nonwoven fabric-united film.

A better understanding of the present invention may be obtained in light of the following examples which are set forth to illustrate, but are not to be construed to limit the present invention.

EXAMPLE 1

A blue-colored thermosetting silicone coating agent was coated on a nonwoven fabric-united film consisting of a plastic film with a basic weight of 11 g/m^2 and a spun-bond polypropylene non-woven fabric with a basic weight of 15 g/m^2 in such an amount that the resulting three ply structure had a silicon coating layer with a basic weight of 0.5 g/m^2 (after drying), and the resulting structure was heat cured by passing it, at a speed of 60 m/min, through a drying chamber at 100℃. At this time, a coating process was conducted with the use of a gravure coating roll.

A blue-colored material of 10 parts by weight (Neo zapon blue 807 manufactured by BASF Co.), and methylethylketone of 90 parts by weight as a solvent were charged into a mixer, and mixed for 2 hours to produce a blue colorant. The blue colorant of 0.6 parts by weight thus produced was mixed with a thermosetting silicone coating agent of 20 parts by weight and normal hexane of 80 parts by weight in a mixer shown in Fig. 2 for 4 hours to produce the blue-colored silicone coating agent.

The thermosetting silicone coating agent consists of organopolysiloxane (syl-off(R)7420, manufactured by Dow Corning Co.) of 19.7 parts by weight as a main component, organosiloxane (syl-off(R)297) of 0.2 parts by weight as a crosslinking agent, and a platinum catalyst (syl-off(R)4000) 0.1 parts by weight as a catalyst.

A mixture of linear low density polyethylene (LDPE 960, manufactured by Hanhwa General Chemiclas Co., Korea) of 98 parts by weight and TiO_2 of 2 parts by weight was molded to the plastic film with the basic weight of 11 g/m^2. The spun-bond polypropylene non-woven fabric with the basic weight of 15 g/m^2 was attached to one side of the plastic film by use of an extrusion lamination process to

produce the nonwoven fabric-united film. During the extrusion lamination process, polyethylene was melted at 290℃, and the nonwoven fabric-united film was passed between a cooling roll and a compression rubber roll at a speed of 80 m/min while under 6 kg/cm^2 of pressure.

A packing back was manufactured, using a packing sheet obtained through the process in example 1, in such a way that a non-woven fabric was positioned at an outermost portion of the packing back and the colored silicone release layer covers a hot melt of the sanitary napkin, and the sanitary napkin was then packed through the packing back.

EXAMPLE 2

A pattern shown in Fig. 9 was printed on a non-woven fabric of the nonwoven fabric-united film according to example 1 with a blue color ink. A New-sky blue manufactured by DAIHAN INK Co., Ltd. was used as the blue color ink. A disposable sanitary napkin was packed according to the same procedure as example 1 using the individual packing sheet produced in example 2.

EXAMPLE 3

A blue-colored thermosetting silicone coating agent was coated on a nonwoven fabric-united film consisting of a plastic film with a basic weight of 25 g/m^2 and a spun-bond polypropylene non-woven fabric with a basic weight of 15 g/m^2 in such an amount that the resulting three ply structure had a silicon coating layer with a basic weight of 0.5 g/m^2 (after drying), and the resulting structure was heat cured by passing it at a speed of 60 m/min through a drying chamber at 100℃. At this time, a coating process was conducted with the use of a gravure coating roll.

The plastic film consists of a linear low density polyethylene of 30 parts by weight, a high density polyethylene of 30 parts by weight, a low density polyethylene of 30 parts by weight, and TiO_2 of 2 parts by weight, and was

produced under the same conditions as example 1. The plastic film thus produced was united with the non-woven fabric by an extrusion lamination process. A disposable sanitary napkin was packed according to the same procedure as example 1 using the individual packing sheet produced in example 3.

EXAMPLE 4

The procedure of example 1 was repeated except that the colored silicone coating pattern was partially coated as shown in Fig. 5c.

EXAMPLE 5

Packing bags composed of packing sheets according to examples 1 to 4 of the present invention were compared with each other, and the results are as follows:

A) Marketability

Packing bags of examples 1 and 2 each have a soft texture because a surface of the packing bag consists of a non-woven fabric, and their appearances each display a shape and color of the non-woven fabric as well as a blue color of the silicone release layer positioned in the packing bag. In the case of example 3, a plastic film deteriorated during a heat curing of the silicone release layer is detected by touching the plastic film and a deformed portion of a packing sheet attached to a hot melt may be observed by the naked eye.

B) The packing bag of example 4 has the colored silicone partially coating a surface thereof, and so an amount of silicone coating agent used to coat the packing bag is reduced by 37.5 % in comparison with that of example 1.

C) Appearance

The packing sheets for the sanitary napkin of examples 1, 2, and 4 are soft to the touch and pleasant to the skin, and look like a high quality material due to its noiseless, textured material. Also, no rustling sound from the packing sheets of examples 1, 2, and 4 is produced when the packing sheets are handled because the

outermost surface of each packing sheet consists of the non-woven fabric. On the other hand, the packing sheet for the sanitary napkin according to example 3 is stiff to the touch, and rustling sounds are produced from the conventional packing sheet because the outer surface of the conventional packing sheet is composed of traditional plastic film.

D) Release property of the packing bag

When a release property of the packing bag according to examples 1 to 4 of the present invention is compared with that of a conventional packing bag produced with the use of the infrared ray, the difference between the two packing bags is negligible.

E) Productivity

The temperature required to seal the packing sheet of the present invention can be increased in comparison with that of a conventional plastic film lacking the non-woven fabric because the plastic film according to examples 1 and 2 of the present invention is protected by the non-woven fabric which has high heat resistance and mechanical strength. For example, the temperature is increased by 10 to 30℃ and a temperature required to seal the conventional packing sheet is 120℃. Thereby, according to the present invention, the time required to pack the sanitary napkins is reduced and productivity of the sanitary napkins is increased.

Industrial Applicability

The present invention is advantageous in that a thermosetting silicone coating agent is coated on a nonwoven fabric-united film and cured thereby preserving the flexibility of a plastic film, improving the workability of a packing sheet, and providing an outer surface of the packing sheet with a noiseless and soft non-woven fabric texture. Other advantages of the present invention are that a sealing temperature of the packing sheet of the present invention is higher than that of a polyethylene film without being united with the non-woven fabric by 10 to 30℃, and so production time of the packing sheet is reduced and a deformation of the packing sheet due to a hot melt is prevented.

The present invention has been described in an illustrative manner, and it is to be understood that the terminology used is intended to be in the nature of description rather than of limitation. Many modifications and variations of the present invention are possible in light of the above teachings. Therefore, it is to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

Claims

1. A colored individual packing sheet for a disposable sanitary napkin, comprising:

a nonwoven fabric-united film consisting of a non-woven fabric with a basic weight of 4 to 25 g/m^2 and a polymer film with a basic weight of 2 to 20 g/m^2; and

a colored silicone release layer formed on the nonwoven fabric-united film by coating a thermosetting colored silicone coating agent on the nonwoven fabric-united film and heat curing such coating agent,

said colored silicone release layer being positioned in an individual packing bag to cover a hot melt adhesive of an individual sanitary napkin.

2. The colored individual packing sheet according to claim 1, wherein the colored silicone release layer consists of a silicone-based coating agent containing a thermosetting organopolysiloxane.

3. The colored individual packing sheet according to claim 1, wherein a partial colored silicone release layer consisting of the colored silicone coating agent is partially formed on the nonwoven fabric-united film in such a way that the colored silicone release layer covers a hot melt of the sanitary napkin within an individual packing region for the sanitary napkin on a surface of the nonwoven fabric-united film.

4. The colored individual packing sheet according to claim 3, wherein the individual packing region for the sanitary napkin on the nonwoven fabric-united film is partitioned by a restricted mark, and the partial silicone release layer consisting of the colored silicone coating agent is formed on the nonwoven fabric-united film in such a way that the partial silicone release layer is positioned at an offset value apart from the restricted mark.

5. The colored individual packing sheet according to claim 1, wherein the partial colored silicone release layer consisting of the colored silicone coating agent formed on the nonwoven fabric-united film is narrower than the nonwoven fabric-united film.

6. The colored individual packing sheet according to claim 1, wherein the partial colored silicone release layer consisting of the colored silicone coating agent is formed on the nonwoven fabric-united film in a band shape while leaving predetermined spaces at both sides of the nonwoven fabric-united film.

7. The colored individual packing sheet according to claim 1, wherein the colored silicone release layer consists of the colored silicone coating agent produced by adding a colorant to a thermosetting silicone coating agent.

8. The colored individual packing sheet according to claim 1 or 7, wherein the colored silicone release layer formed on the nonwoven fabric-united film by coating the colored silicone coating agent on the nonwoven fabric-united film and heat curing such coating agent consists of the colored silicone coating agent produced by adding the colorant including a pigment or a dye to the thermosetting silicone coating agent.

9. The colored individual packing sheet according to any one of claims 1, 3, 4, 5, and 6, wherein a decorative pattern is printed on a surface of a non-woven fabric of the nonwoven fabric-united film.

DRAWING

Fig. 1

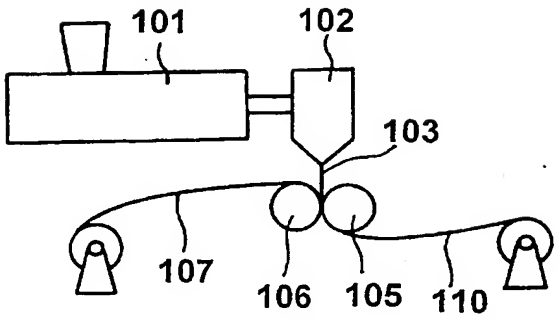


Fig. 2

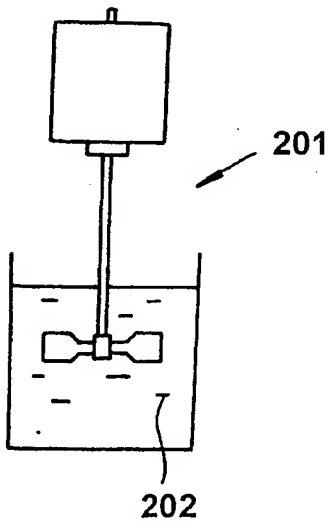


Fig. 3

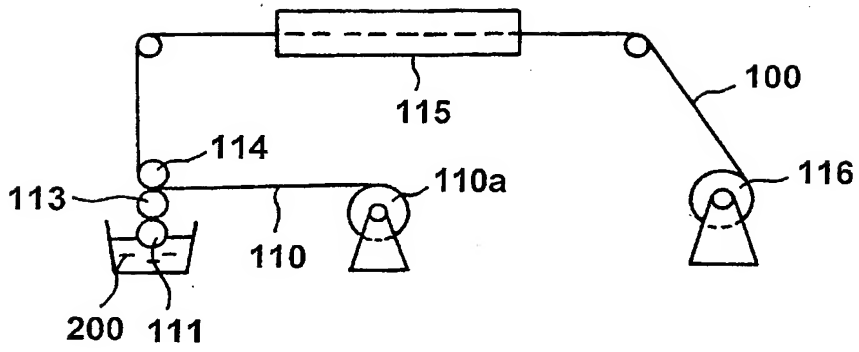


Fig. 4

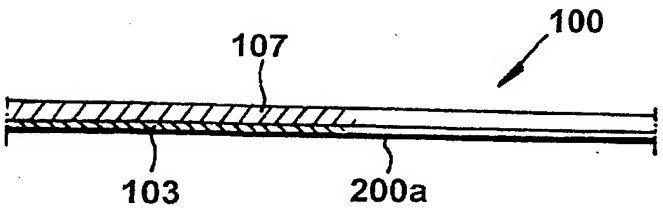
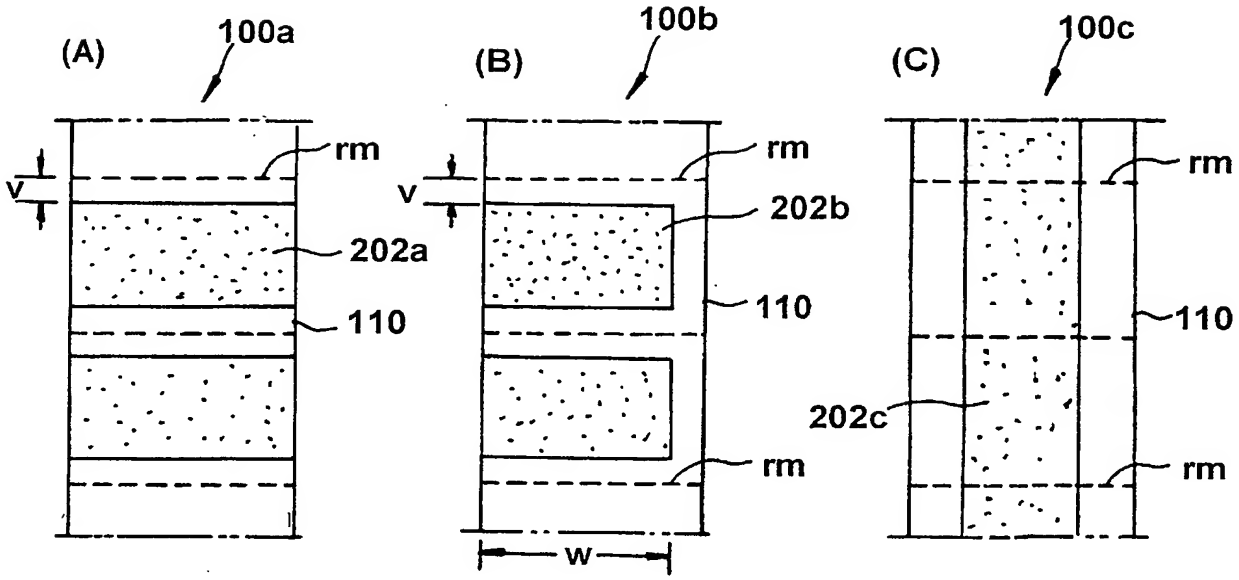


Fig. 5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w
(C)
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rm
110
202c
rm

Fig. 6

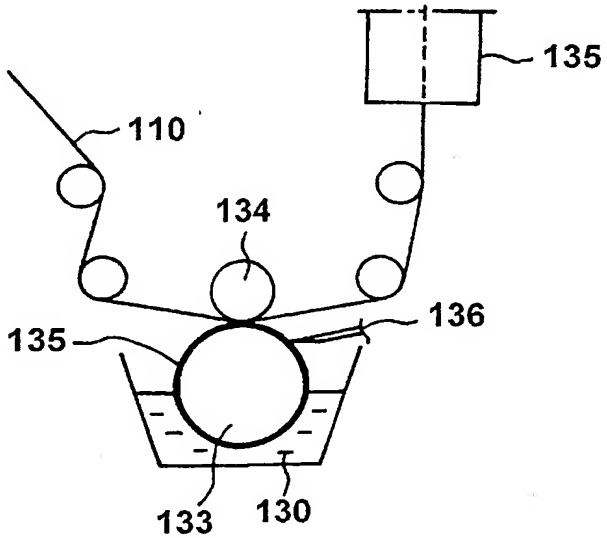
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Fig. 7

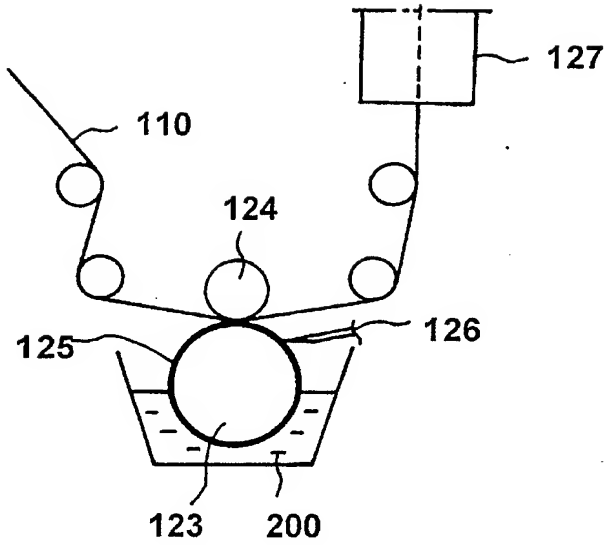


Fig. 8

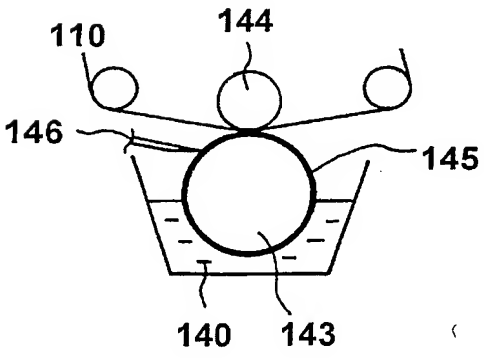
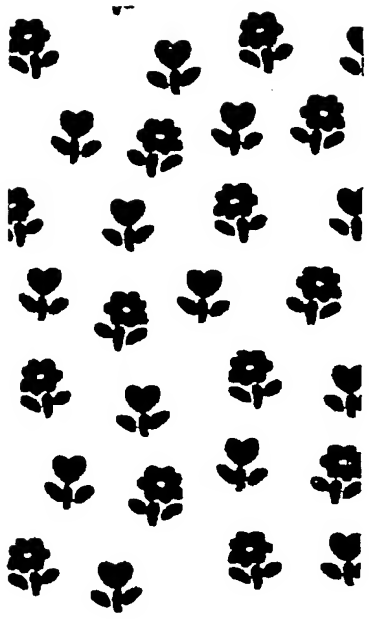


Fig. 9



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR02/00122

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 A61F 13/84

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61F 13/15, B32B, B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the internationl search (name of data base and, where practicable, search terms used)

NPS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 97-29723 A (NITTO DENKO CORPORATION) 21. AUGUST. 1997 See the whole document	1-9
Y	US 6234229 A (TAO MACHINE INDUSTRY, INC.) 22. MAY. 2001 See the whole document	1-9
A	WO 97-6947 A ((NITTO DENKO CORPORATION) 27. FEBUARY. 1997	1-9
A	WO 2000-40183 A (THE PROCTER & GAMBLE COMPANY) 13. JULY. 2000	1-9
A	KR 90-17781 A (YU CHUL KUN) 20. DECEMBER. 1990	1-9

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
08 JULY 2002 (08.07.2002)	08 JULY 2002 (08.07.2002)

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Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR02/00122

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